

# PATENT SPECIFICATION

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## (54) IMPROVEMENTS IN AND RELATING TO PASSENGER VEHICLES HAVING AN AISLE LINED WITH SEATS



(71) We, KARL KASSBOHRER FAHRZEUGWERKE GmbH, a German body corporate of Peter-Schmid-Strasse 13, 7900 Ulm/Donau, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to passenger vehicles having an aisle lined with seats.

According to the invention there is provided a passenger vehicle having an aisle 15 extending in a predetermined direction, a row of seats lining the aisle with each seat facing in a direction parallel to said predetermined direction, each seat having a frame and an arm-rest extending in a direction 20 parallel to the predetermined direction, the arm-rest when in an arm supporting position projecting widthwise into the aisle, each arm-rest being supported at one end portion of an elongate member extending at 25 an angle to the arm-rest, the support being supported at its other end portion on a corresponding frame for pivotal movement about an axis extending parallel to the predetermined direction, and locking means for 30 locking the support member to the frame against relative pivotal movement in two predetermined relative angular positions located substantially 180° apart, whereby when in one predetermined angular position 35 the arm-rest is located in said arm supporting position and when in the other predetermined angular position the arm-rest is folded away.

According to the present invention there 40 is further provided a passenger vehicle having an aisle extending in a predetermined direction, a row of seats lining the aisle and facing a direction parallel to said predetermined direction, each seat comprising a sitting 45 portion, a back rest and an arm-rest, the

arm-rest having an arm-supporting portion extending parallel to the sitting portion and when in an operative position extending widthwise into the aisle, and a crank portion extending substantially in the direction of 50 the back rest, the crank portion being pivotally secured to the back rest for movement about an axis extending substantially perpendicular to the back rest to displace the arm-supporting portion between an 55 inoperative position located below the upper surface of the sitting portion and the operative position in which it can support the arm of a passenger accommodated in the seat, and means for locking the arm-rest 60 against rotation in its operative position.

An omnibus seat embodying the invention will now be described, by way of example, with reference to the accompanying 65 diagrammatic drawings, in which:

Figure 1 is a side elevation of the omnibus seat;

Figure 2 is a front elevation of the seat of Figure 1 located on the opposite side of a central aisle from a previously proposed 70 seat; and

Figure 3 is a fragmentary section taken on line III-III of Figure 1 and to an enlarged scale.

Figure 1 shows an omnibus seat 2 located 75 immediately adjacent the central aisle 1 of the omnibus. The seat includes a supporting frame 9 accommodating upholstery and has an arm-rest 3, carried by the supporting frame on the side of the seat that borders on 80 the central aisle. The arm-rest 3 is so located that it leaves the entire sitting surface 4 of the seat upholstery unobstructed for the disposal of the passenger. The seat includes 85 a back-rest 5 of upholstery which extends upwardly from the surface 4 on the supporting frame 9. The back-rest 5 of the seat conforms generally to the anatomical outline of the backs of passengers and is provided at its 90 upper end with a head-rest 6.

The arm-rest 3 includes a main arm supporting portion 8 extending substantially parallel to the sitting surface 4, of the seat and a crank 7 which makes an obtuse angle 5 with the main portion 8. The end portion of the crank 7 remote from the main portion 8 is pivotally supported on the frame 9 for rotation about an axis 10 extending substantially parallel to the longitudinal axis of the 10 main portion 8 of the arm-rest 3. The crank 7 is rotatable through at least 180 degrees between a top dead centre position and a bottom dead centre position. When the crank 7 is in the bottom dead centre position 15 the main portion 8 of the arm-rest 3 lies in a horizontal plane located below the plane of the sitting surface 4 (see Figure 1). The crank 7 has a length which corresponds substantially to one half of the distance between 20 the main portion 8 and, when located in its inoperative position, that is in a position below the level of the sitting surface 4, and the main portion 8 when in its operative position, that is when it is in a position in which 25 it can support the arm of a passenger. Accordingly when the crank 7 is rotated from the bottom dead centre position to the top dead centre position, the main portion 8 is moved outwardly into the central aisle 30 and up into the operative position as illustrated in Figure 2.

The crank 7 is arranged to be automatically locked when it reaches the top dead centre position and again when it is returned 35 to its bottom dead centre position as will now be described.

The crank 7 is engaged by a pivot pin 11 which supports the crank 7 for rotation about the axis 10. The pin 11 has a key 12 40 by means of which the pin 11 is keyed into the crank. The key 12 is also arranged to engage abutments (not shown) on the frame 9 which limit the pivotal range of the pin 11 to substantially 180 degrees. Thus the over-rotation or over-pivoting of the arm-rest 3 45 inwardly towards the sitting surface 4 is prevented. A portion 13 of the pin 11 which projects from the crank 7 engages a pair of axially spaced tubular members rigid with 50 the support 9 and which rotatably carry the pin 11. The portion of the pin 11 located intermediate the two tubular members carries a radially extending lug 17. The lug 17 is arranged to selectively engage two grooves 55 in the adjacent end face of one of the two tubular members. The two grooves are angularly spaced relative to each other by about 180 degrees and are so located that when the lug 17 engages one of the grooves, 60 the crank is in its bottom dead centre position, and when the lug engages the other groove, the crank is in its top dead centre position. It will be appreciated that in moving the crank from its bottom dead centre 65 position to its top dead centre position the

arm-rest is pivoted outwardly into the central aisle 1 and through at least 180 degrees (see Figure 2). A spiral spring 14 is mounted on the portion of the pin 11 intermediate the two tubular members. One end of the 70 spring is secured to a strap 15 rigid with the frame 9. The other end of the spiral spring 14 is secured to a plate 16 on the lug 17. The spring acts to urge the lug against the tubular member having the two grooves. 75

In operation when the crank 7 is in the bottom dead centre position, the arm-rest lies below the sitting surface 4 and thus enables passengers to move radially between the seat and the aisle. When the passenger occupies the seat and requires to use 80 the arm-rest, the main portion 8 of the arm-rest is gripped and pulled forwardly parallel to aisle, to disengage the lug 17 from its corresponding groove. The arm-rest is then 85 pivoted outwardly into the passage and upwardly into the operational position. As the arm-rest approaches the operational position the lug 17 will become aligned with the other groove and be snapped into 90 engagement with the groove under the bias of the spring. The arm-rest is thus automatically locked against rotation in its operational position. To lower the arm-rest again the main portion 8 is gripped and pulled 95 forwardly to disengage the lug 17 from the groove and then the arm-rest is pivoted downwardly until it becomes automatically locked in its inoperative position. The portion 13 of the pin 11 can be covered by a 100 wall 18 of the seat back or of the side frame (see Fig. 3). As shown in Figure 2 on the left hand side of the aisle there is the described chair with the arm-rest located in its inoperative position (the locus of the arm- 105 rest being shown in broken lines). On the right-hand side of Fig. 2 there is shown a previously proposed seat having an arm-rest pivotally secured to the side of the chair for rotation about an axis extending trans- 110 versely of the aisle. In Figure 2 the arm-rest is located in an inoperative position extending vertically upwardly adjacent the back rest of the seat. It will be appreciated that using seats such as that shown on the left- 115 hand side of the Figure 2, the central aisle is made considerably broader in the region of the hips of a passenger with the arm rests in their inoperative positions than when using the previously proposed seat. 120

#### WHAT WE CLAIM IS:—

1. A passenger vehicle having an aisle extending in a predetermined direction, a row of seats lining the aisle with each seat facing in a direction parallel to said pre- 125 determined direction, each seat having a frame and an arm-rest extending in a direction parallel to the predetermined direction, the arm-rest when in an arm supporting position projecting widthwise into the aisle, 130

each arm rest being supported at one end portion of an elongate member extending at an angle to the arm-rest, the support being supported at its other end portion on a corresponding frame for pivotal movement about an axis extending parallel to the predetermined direction, and locking means for locking the support member to the frame against relative pivotal movement in two predetermined relative angular positions located substantially 180° apart, whereby when in one predetermined angular position the arm-rest is located in said arm supporting position and when in the other predetermined angular position the arm-rest is folded away.

2. A vehicle according to claim 1 wherein the locking means comprises, guide means for constraining the frame and support member for relative angular movement about said axis but allowing relative axial movement when in one of said two predetermined angular positions into a relative axial position where relative angular movement is prevented, and biasing means providing a bias between the frame and the support member towards said relative axial position.

3. A vehicle according to claim 1 wherein the support member is rigid with a shaft which engages a sleeve rigid with the frame, and wherein the locking means comprises a pin extending radially from the shaft, and biasing means urging the pin into engagement with an axial end face of the

sleeve, the axial end face of the sleeve having two axially extending slots which can be engaged by said pin when the frame and support unit are in respective ones of said two predetermined relative axial positions. 40

4. A passenger vehicle having an aisle extending in a predetermined direction, a row of seats lining the aisle and facing a direction parallel to said predetermined direction, each seat comprising a sitting portion, a back rest and an arm-rest, the arm-rest having an arm-supporting portion extending substantially parallel to the sitting portion and when in an operative position extending widthwise into the aisle and a crank portion extending substantially in the direction of the back rest, the crank portion being pivotally secured to the back rest for movement about an axis extending substantially perpendicular to the back rest to displace the arm-supporting portion between an inoperative position located below the upper surface of the sitting portion and the operative position in which it can support the arm of a passenger accommodated in the seat, and means for locking the arm-rest against rotation in its operative position. 45 50 55 60

5. A seat substantially as hereinbefore described with reference to Figures 1 and 3 of the accompanying drawings. 65

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COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale.  
SHEET 1

Fig.1

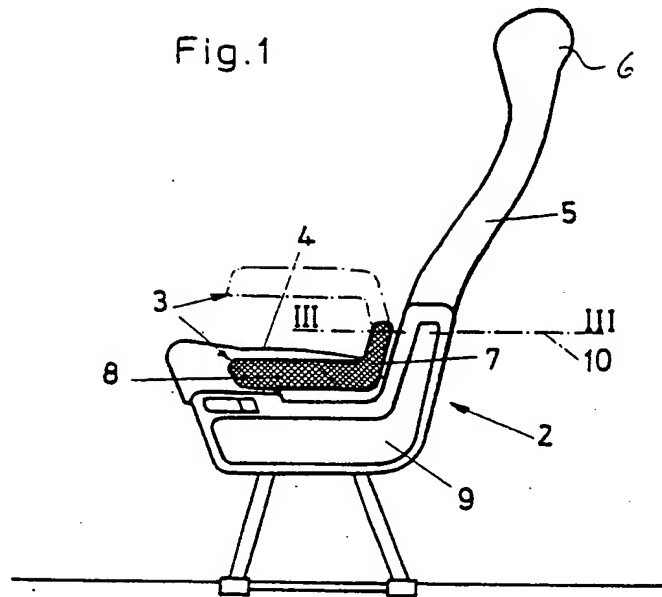
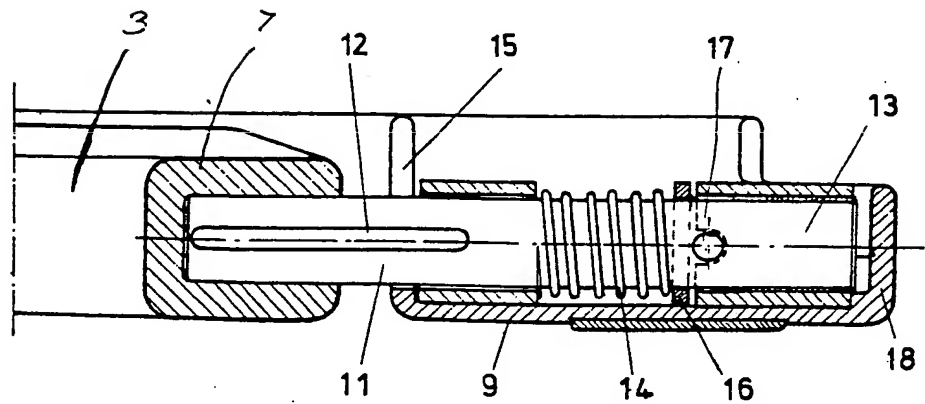


Fig.3



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COMPLETE SPECIFICATION

2 SHEETS

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SHEET 2

Fig. 2

